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Sub-Editor :

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JULY, 1918.

Editorials.

IS THE PRACTICE OF MEDICINE MORE AN ART THAN A SCIENCE ?

ART may be described as the employment of means to some end on certain principles with which we are familiar, and implies skill of a practical, useful or technical nature in carrying the work out. "Art is long and life is short," and in its practice the skilled observer will be gathering jewels of varied value and lustre from his cradle to his grave. The proper combination and setting of these jewels of experience will denote the finest and most finished work, and bring to the workman a distinction which will be both satisfactory and good. Intuition must have its prominent place in the matter and a balanced and trained observation be able to discern that which is effective, progressive and permanent from the futile, stationary and temporary. The full and fruitful practice of an art does not, as a rule, develop early in life; it involves close application, study and deduction over an extended period. Many a true artist has exclaimed: "I have only just learned how to live in my appointed sphere when it is time to die." The art of medicine is no exception to the rule that he who travels always on the beaten track is a sorry wayfarer, who misses much that is useful, edifying and valuable. The great artist is he who can produce the best results from experimental work carried out by himself or others. The general practitioner can advance his art by taking notes of his cases and analysing and discussing these notes. Instead of "dying with all his music in him," it is his duty to conserve and pass on to his fellows the knowledge and experience that he has acquired whilst living

laborious days. The description of detail which future years may deem essential or non-essential is important, and can be recorded by any man with a retentive memory and a correct vision. In the quiet by-ways of practice, as well as in its hurry and scurry, art may be picked up and put down. The best primary results in the art of medicine will probably arise where the field for labour is wide and extensive and the workers distinguished and occupied separately in regard to duties and their performance. A disease having been recognised and classified, then let separate bodies of artists attack it each in their several ways. The ability of the workers will vary, but each, if true to temperament, will soon recognise whether his work is going to be a success or failure. The advance of medicine depends on a recognition of the disease, consideration of the means available for attacking it, detailed application of the means, notes, reasonings and deductions from the details. There are many ways of dealing with mange; perhaps most of them may be effective, but the proper application of them depends on the true art of the operator. There has been a vast domain for the earnest and painstaking artist in medicine in the present war, and it is very gratifying to see how numerous discerning men have responded to the call for keen observation, deduction, and copious note taking. As a result the ranks of the artists in medicine cannot but be improved both in quality and quantity. The faculty of sound deduction is a valuable attribute to the study of the art of medicine.

Just one point about deductions: These may be true or false. It is not given to every man to be able to discriminate between the two. A certain doctor who was going away on a holiday engaged a ***locum*** and had a day with him before departing on his vacation. During the day a call to a critical case came, and the doctor and the ***locum*** attended together. After seeing the case the following conversation occurred.

Locum: "My word, doctor, you soon diagnosed that case. However did you know, without taking the man's pulse, or looking at his tongue, or examining him carefully, that his illness was caused by eating too many oysters?"

Doctor: "Oh, simple enough, my dear man. I saw the shells under the bed."

The deduction happened to be right. Doctor returns home from holiday; ***Locum*** meets him and tells him of a wonderful case he has had that very day of a man seriously ill from eating too much horse-flesh, and that he diagnosed the case at a glance.

"And pray how did you do it?" said the doctor.

"Oh, easy enough, my dear fellow," said the ***locum***, "I saw the saddle under the bed."

The deduction happened to be wrong. The moral is that the true artist in medicine must be sound in his deductions if his treatment is to show effective medical results. G. M.

THE DIETETIC VALUE OF HAY-LOFT SWEEPINGS.

A PAPER under the above title, by Professor Linton, in the present issue of the VETERINARY JOURNAL, is of special interest at the present time when everything with any prospective value is utilised. It is of especial importance to those who have large numbers of Army animals under their care, because in most units, and in the Veterinary Hospitals especially, where every care is taken to economise, teach economy, and utilise every available scrap of fodder, it has been the practice for some time to shake out the hay used for feeding (and to fill the hay nets) over a wire screen, solely with the intention of saving the hay seeds which would otherwise fall to the ground, and be trampled in the mud or otherwise wasted.

These hay seeds are utilised in the same manner as chaff, and up to the present time have been considered as a most nutritious and valuable adjunct to the horse's ration. It is, therefore, with some surprise that we read the deductions and conclusions drawn by Prof. Linton that "there does not seem any justification for the opinion that great benefit would be derived by adding loft sweepings to the diet of horses." It is true that at times, when mouldy and dirty hay is the ration issue (and in war-time this must occasionally occur), there is a considerable amount of dust, and at times this causes the screenings to be condemned; but the general opinion of those who have used the hay seeds as chaff (the latter not being obtainable), is that considerable benefit has resulted to the horses; and for the purpose of saving this, large square boxes with a movable wire lid have been devised, and are provided in the necessary numbers for every Veterinary Hospital.

The Order in most Veterinary Hospitals, and in many units in the Field, too, is that the hay should be spread out and the hay nets filled on the top of these. The resulting accumulation of hay seeds and small brittle hay "bents" is enormous in quantity, and will give the debility cases in a hospital quite a lot of hold—aromatic when steamed, as admitted by Professor Linton, and certainly a stimulant to a hesitating appetite. It may be that a false opinion is formed as to its nutritive qualities, but this can only be proved, as Professor Linton suggests, by a series of properly-carried-out experiments, and until these have

been done, and the results published, there will, certainly be no hesitation in "carrying on" the present system as the impression, gained from clinical results, is that there is considerable nutritive value gained which would otherwise be wasted.

LADIES' AUXILIARY VETERINARY RELIEF FUND

IT is interesting to read in the *Journal of the American Veterinary Medical Association* the following notice :—

Ladies' Auxiliary Veterinary Relief Fund Committee.—Eligibility to membership will include the wives, mothers, daughters and sisters of all veterinarians in the United States and Canada. The president, Mrs. W. H. Hoskins, was empowered to appoint a representative for each State to serve as a medium for communicating when necessary with the individual women within her jurisdiction, and also as a medium for them to communicate with the officers of the national organisation. It is earnestly hoped that every woman eligible to membership will avail herself of this opportunity to assist others, and through community of interest learn to know more of other women connected with veterinary affairs. The annual dues will be 50 c., payable to each State representative, who in turn will transmit them to the national treasurer. The fee for each individual is small, but if the ladies respond as is hoped, the total would make a working basis for definite war relief work. Subscriptions of larger amounts will be acceptable, but the annual fee of 50c. is all that is required for membership. President, Mrs. W. Horace Hoskins, 135 E. 30th Street, New York City ; recording secretary, Mrs. Charles E. Cotton, 3145 Portland Avenue, Minneapolis ; corresponding secretary, Mrs. Asher Lockhart, Veterinary College, Kansas City, Mo. ; treasurer, Mrs. H. Jensen, 1320, Main Street, Kansas City, Mo.

Whether this refers to an association like the Victoria Benevolent Fund, which is doing such magnificent work in England amongst those whom misfortune has overtaken, or whether it is intended to afford similar splendid help and encouragement to the soldiers of the American Army Veterinary Corps as is being done to those of the British Service by the kind thought and hard work of Mrs. Moore and her earnest co-workers, is not quite clear. Probably both are intended, and certainly no better examples could be copied ; and in any case we give a cordial word of praise and welcome to the kindly thought which prompted the ladies whose names are mentioned to start such a splendid idea. We are sure that it will meet with the approval and support of everyone who is connected with the profession in America, and especially those who are eligible for membership.

Original Communications.

THE DIETETIC VALUE OF HAY-LOFT SWEEPINGS.

By R. G. LINTON, M.R.C.V.S., Professor of Hygiene,
Royal (Dick) Veterinary College, Edinburgh.

THE possibility of hay-loft sweepings—euphemistically called "hay seeds"—being more generally utilised to augment the present-day restricted animal rations has been, it is known, under consideration. In fact, sweepings that have lain in lofts for many months have been collected, more or less cleaned, cooked and fed to horses.

The name "seed" is at once suggestive of a rich store of nutriment, and this has doubtless led some horse feeders to think that the partial cleaning and preparation of these sweepings would be a profitable undertaking, inasmuch as their use might effect a saving of more costly food.

Loft sweepings consist of cut and broken hay and straw, chaff, a fair quantity of immature "seeds," a variable amount of sand, dirt, and debris of all kinds, including excretal matter of rats and mice. The seeds, as one would expect, are light in weight, consist chiefly of husk and contain very little "kernel." Including dirt of all origins, loft sweepings have an average weight of about 8 lb. per bushel, 10 lb. being probably the maximum, while the recognised weight of Italian rye grass seed is 24 lb. per bushel. If, therefore, weight per volume is any guide, hay-loft sweepings cannot contain an appreciable proportion of mature seeds. That such seeds as are present consist of little else than husk is clearly shown in Fig. 1. The cylinder on the right contains 1 ounce by weight of Italian rye grass seed of 99 per cent. purity; that on the left, 1 ounce of seeds cleaned of dirt and straw, that were obtained from a loft used to hold rye grass hay. In order that no shaking down could occur, the material was poured into cylinders without bottoms.

There are various methods of disposal of loft sweepings. They may be thrown on the manure pit or to fowls; they had a pre-war market value ranging from 1s. 6d. to 2s. 6d. per cwt. to merchants who found a profitable use for them; sometimes stock-keepers get rid of them by adding a shovelful now and then to the food of their horses and cattle. Lastly, they may be washed in several changes of water, steamed or stewed, and mixed a few pounds at a time with any other food that may be given.

Although the practice of giving uncleaned sweepings to live-stock may be followed for a time apparently without danger, it is certainly not one unattended by risk. A dairy farmer well known to the writer

added a bag of the seeds to the mash of his cows; practically every cow in the herd became ill, and, though no deaths resulted, the ill-effects were quite pronounced. Specific forage poisoning, due to *bacillus botulinus*, has not, so far as the writer knows, occurred or been proved to occur in this country, but unquestionably it is seeking such or similar trouble to feed material heavily contaminated with vermin excreta and containing a high proportion of other dubious dirt.

Apart from the hygienic aspect, it is of interest to enquire into the potential feeding value of these sweepings. For this purpose two

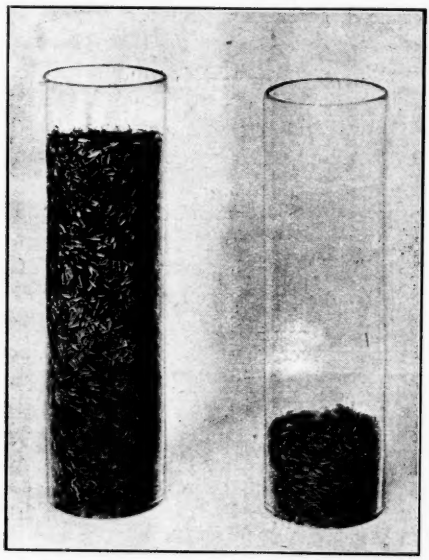

FIG. 1.—Each cylinder contains 1 ounce by weight of hay seeds; on the right pure rye grass seed, on the left "seed" from loft sweepings.

samples were taken for examination. One sample (A) was obtained from a loft that had probably contained all kinds of hay and straw; it is of especial interest, as the material was actually being washed and fed to horses. The second sample (B) was taken from a loft that was kept cleaner than usual, and that had held only rye grass hay. The sweepings, as stated, contain a certain amount of broken hay and straw, and as in practice this forms an integral part of the material, no attempt was made to remove it before each sample was analysed.

Of sweepings A, a sample was taken just before it would have been washed; ½ lb. was separated into three lots with three grades of sieves—30 meshes per square inch, 120 and 600. The three siftings are shown in Fig. 2. No. 1 consists of hay and straw, and weighs

2½ ozs.; No. 2 of seeds and weighs 3¼ ozs.; and No. 3, of fine dust weighing 2¼ ozs. Thus it is seen that the greater part of so-called hay seeds is hay, straw, and dirt. Of the same lot of sweepings a sample, A^1, was taken after it had been washed in three changes of, water, which, while removing the greater part of the heavy dirt, made a decoction of vermin excreta and other objectionable matter.

This sample, after most of the water had been squeezed out of it was air-dried and analysed. Sample B, a much cleaner lot than A, was subjected to analysis without any preparation, as on the premises from which it was taken it is the practice to dispose of the sweepings by adding a little now and then to the horses' food while it is being mixed. Its analysis is given in the table, and the cleaned seeds are shown in Fig. 1 photographed with pure rye grass seeds for comparison. In order to determine the potential feeding value of pure rye grass seeds the sample shown in the figure was analysed, the result being added to the table.

Analyses of loft sweepings, Italian rye grass seeds, and, for comparison, a good sample of meadow hay:—

	Moisture.	Protein.	Fat.	Carbohydrate.	Fibre.	Ash.
*Washed Sweepings, Sample A^1 ..	10·83	13·15	1·53	47·46	22·16	4·87
*Unwashed Sweepings, Sample B ..	12·53	13·15	1·23	37·69	20·89	14·60
*Rye Grass Seeds ..	14·80	8·75	0·60	42·66	28·96	4·23
Meadow Hay ..	14·00	9·80	3·00	41·40	26·20	6·00

It is necessary to draw attention to the percentage of crude protein in the loft sweepings, as indicated by analysis. That the percentage should be equal is merely a coincidence, and the evidence of these two samples must not be taken as representative of all such material. Furthermore, and this is of great importance, the percentage of crude protein as here shown is calculated by multiplying the total nitrogen by 6·25, the recognised factor for cattle foods. There is, therefore, no distinction made between true protein and amides, or non-protein nitrogenous substances, and as the sweepings contain a high proportion of dirt and excretal matter containing nitrogen of no nutritive value, the protein content as here estimated is an inflated one. Since, however, the object of this paper is to show the maximum amount of nutriment that *might* be obtained from such material, rather than its actual value, the total nitrogen present has been credited.

The selection of digestion coefficients suitable for this class of food is essentially speculative, and those applicable to a medium grade

*Analysis made by Prof. G. H. Gemmell, F.I.C.

meadow hay have been taken, namely: Protein, 58; fat, 18; carbohydrate, 58; and fibre, 40. For the purpose of calculating the net dynamic value an availability of 65 per cent. has been assumed. (Kellner's V.N. for good meadow hay is 67.)

Using these assumptive factors, then, the three samples of "seeds" may be considered to have a net dynamic value as shown below. For the purpose of comparison with other and more commonly used foods the dynamic values of meadow hay, oats and maize have been added to the table. The values have been expressed in terms of starch equivalent (for fattening or work), per 100 lb. of each food, and in Calories per pound.

	Starch equivalent, per 100 lb.	Calories per lb.
Washed Sweepings, Sample A[1] ..	29	495
Unwashed Sweepings, Sample B ..	25	427
Rye Grass Seeds	27	461
Meadow Hay	30	513
Oats	58	1,000
Maize	77	1,320

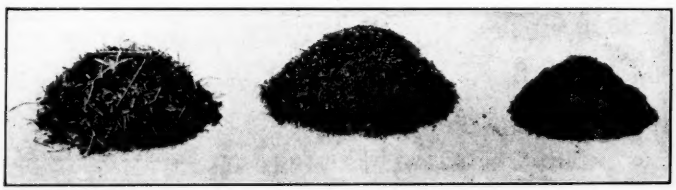

FIG. 2.—Half a pound of loft sweepings separated into three lots—hay and straw, "seeds," and dust.

If the samples A and B are at all representative of this class of food, the food value of loft sweepings may be considered as approximately that of a fair grade meadow hay; at least there is no evidence that they have any higher value, but possibly a lower one. For reasons already stated the crude protein content, as indicated by analysis, must be considered as excessive; neither hay-loft sweepings nor pure rye grass seeds are protein-rich foods, as the layman might think. The N. Ratio of Italian rye grass hay is 1 : 9, and that of the seeds 1 : 7·6.

There does not seem any justification for an opinion that great benefit would be derived by adding loft sweepings to the diet of horses. On the contrary, it would appear to be a practice attended with some danger whether the seeds be cleaned or not. If much energy and fuel be expended in cleaning and cooking the material there can be no econony in its use.

There is no doubt that stewing the sweepings, provided they are not too dirty, brings out the pleasant aromatic odour characteristic of steamed hay, and such material when added to cut straw and oats may stimulate a hesitating appetite and thus lead to a false impression as to its real nutritive value. This can only be determined by a series of feeding experiments carried out under standard conditions and with due regard to possible fallacies.

THE NORMAL ERYTHROCYTE COUNT OF EAST AFRICAN NATIVE CATTLE.

By Capt. H. E. HORNBY,
South African Veterinary Corps.

The commonest variety of cattle in East Africa is a small, short-horned, humped animal, and it is found in Northern Rhodesia, Nyasaland, "German" East Africa, British East Africa, as well as in those few parts of Portuguese East Africa north of the Zambesi where native cattle are seen. In parts of Uganda, and the adjoining parts of British East Africa and "German" East Africa, one meets with a straight-backed, large-horned variety of cattle, but of these I am without experience, and my remarks apply only to the former variety.

In a fairly recently published text-book that I picked up at Dar-es-Salaam, namely Marek's "Lehrbuch der Klinischen Diagnostik der Inneren Krankheiten der Haustiere (1912)," the following are given as the normal erythrocyte counts of cattle :—

Bulls	6,5——7	Mill. per Cmm.
Cows	5——6	,, ,,
Oxen	5——6,5	,, ,,
Young stock	7——	,, ,,
Calves	5——8,5	,, ,,

If I remember rightly, similar figures are given in most text-books that deal with the subject. On the other hand, I see in an odd number of the *Centralblatt* that I have just found (Centralbl. f. Bakt 1 Abt Bd. 74. Heft 1/2. 1914), that Lignieres, in an article on "Bovine Anaplasmosis in the Argentine," gives as high a figure as 8,400,000 per cmm. to represent the red-cell count of a common cow of that country.

During the past five years I have had occasion to make a good many blood counts of cattle in various parts of Northern Rhodesia, Nyasaland, British East Africa, and "German" East Africa, and among them were some of normal, healthy cattle. As an opportunity for the continuation of this work may not be given to me, I publish these few figures as an indication to workers on tropical diseases of what is likely to be found to be the normal erythrocyte counts of East African native cattle.

The haemacytometers used have been those of Thoma-Zeiss, and their accuracy and the correctness of my technique I have tested from time to time by making examinations of my own blood and comparing the results with the well-known standard. Also as I have, when using the same instruments and technique, encountered bovine blood-counts as low as 2,000,000 in certain very anæmic conditions, I think that the high figures I am about to record can be looked upon as representing an actual state of affairs.

Animal.	No. Exd.	Minimum.	Maximum.
Bulls	1	9,700,000	
Cows	2	7,800,000	10,000,000
Oxen	1	9,600,000	
Young stock ..	3	8,000,000	11,200,000
Calves ..	5	9,500,000	15,000,000

All the above animals were in robust health, with, perhaps, the exception of the heifer with the count of 8,000,000.

In the text-book mentioned above it is stated that "with the exception of the newly-born and very young, immature animals in general show a somewhat higher blood-count than do adults of the same species." Also "male animals generally show a higher count than do the corresponding females." My own experience is that both these statements are correct, but my data is too scanty to be of value in corroborating them.

PERIODIC OPHTHALMIA.

By H. C. WILKIE, F.R.C.V.S., F.Z.S.,
Paris.

I HAVE been reading the report of the Conference of Officers of the French and British Army Veterinary Service held recently in France, and have been much interested in Colonel Newsom's paper, and the discussion which followed, on Periodic Ophthalmia.

As the treatment there given is necessarily only in outline, I have thought it might perhaps interest someone if I gave a few notes of a method of procedure in treatment which I have found most useful. Although we have no exact knowledge of the cause of the disease, I think most of those who have had to deal with it now believe it is due to a specific organism. On this assumption I (and probably very many others) have formed the opinion that the point of entry of the organism is by way of the conjunctiva, and further, that the organisms or their living spores are contained in dust. This theory, to me, is supported by the fact that I have never heard of any cases among horses which were not living on dry foods, and have not been able to discover any information of cases, either primary or secondary, occurring in horses living entirely on grass.

I personally feel considerable doubt as to the periodicity of the disease, if by that term is meant a further and fresh attack wholly apart from the possibility of a new infection. There are two special points with regard to treatment which have been sufficiently successful with me to make me consider them definitely essential.

The first is the thorough cleaning of the conjunctival sac as a preliminary to other treatment.

The second is that with a view to the prevention of further infection all food given, hay as well as manger food, should be damped, and this, I think, is *very important.* Damping the food might indeed well be adopted in all outbreaks, merely as a measure of prevention.

The cleansing of the conjunctival sac, with a view to cutting off the supply of infection from any lurking organisms, must be very thoroughly done. I have found it is best to use for the purpose a hot solution of boric acid. If the eyes are first fomented with the hot solution, the patient evidently finds relief from the heat, and soon there is no difficulty in thoroughly irrigating the conjunctival sac in all its folds, though this requires the utmost care and patience.

After this irrigation, an injection of 2 c.c. of Lugol's solution of iodine is made into the supra-orbital fat, and then, after giving the patient a short rest, a few drops of a solution of perchloride of mercury, 1 in 4,000, are placed within the lower lid near the inner canthus. The lid is held down for a few seconds, in order to prevent the solution coming into immediate contact with the cornea. This preliminary cleansing effectively carried out well repays one for the trouble. It gives the treatment an excellent start, and if the surroundings are good, and only damped food given, I think the examination next day usually shows that the case is well in hand, at any rate where it is in a reasonably early stage.

As it is essentially a condition of iritis primarily, I believe it is quite necessary to *keep* the iris under the influence of atropine, and to prevent all exposure to any but subdued light whenever possible.

With regard to the control of blood pressure, adrenalin in solution is not always in the best condition, and more reliance can be placed on epinine, which is a much more stable substance, and appears to be fully as effective. The bowels should, I think, be kept well open.

Early diagnosis is rather important, and I think cases can be picked out when in an early stage by the appearance of extremely fine vessels, normally invisible, which show themselves just outside the circumference of the iris, and often, I believe, first on the inner side as a hazy pink patch, a condition which occurs before more active symptoms call attention to the case. I do not wish to dogmatise on this point,

but I have noticed the condition several times, and I only give the observation for what it is worth.

The whole general history of periodic ophthalmia seems to me to give warrant to the assumptions upon which the treatment described in these notes is based, that is that the disease is due to an infection, conveyed in dust, and which obtains entry by way of the conjunctiva.

MILK DEFECTS IN THE COW AND THEIR REMEDIES.

By G. MAYALL, M.R.C.V.S.,
Bolton.

Failure in secretion may arise from dietetic causes, such as lack of albumen in the food, or too watery food, changes of food, use of too many and varied feeding-stuffs, and damaged food. Cold, damp weather, anxiety about calves or stall companions, and œstrum, hinder milk secretion. Occasionally this defect comes on suddenly in primipara, and without any ascertainable cause.

The remedies in such cases consist in the prescribing of fennel, coriander, carraway, aniseed, or juniper berries, in union with flowers of sulphur, antimony, and salt. Scalded food, mashes, and brewers' grains may be given. A good prescription for lack of secretion is a powder of : Flowers of sulphur, ½ drachm ; fennel, ½ ounce ; juniper berries, ½ ounce. Give one two or three times daily. Another one is : Antimony sulphide, ½ ounce ; aniseed, 1 ounce ; given two or three times daily in fennel tea.

The failure in secretion due to diseases is sought to be remedied by appropriate treatment of the patient.

Watery Milk is caused through food poor in protein, watery food, weak digestive power, and wasting diseases.

Internal bitters and remedies that aid digestion are indicated together with change of food. Foods which increase the fat content of milk are palm seed oil, cocoanut oil cake, and peanut meal.

Salty Milk arises from intestinal catarrh, or inflammation of the udder, and these diseases must be treated to remedy the defect.

Bloody Milk.—The milk on standing deposits a red layer at the bottom. It is caused by rough milking and impatient sucking. It is seen in increased blood pressure in the udder in heifers and good milkers. Quick change to intensive food, such as clover pasture, may cause it. The remedies are gentle milking, spare, cooling diet, laxative medicine, and 2 drachm doses of liquor ferri perchlor fort, which has given excellent results with us.

Bad Smelling Milk arises from pasturing on low meadows ; feeding on spoilt food (the giving of rancid meal, or bad silage), and gastric affections, with decomposition of food in the rumen, appear to favour it. The remedy is to change the diet and treat the digestive trouble.

Bitter and Rancid Milk—due to lupines, decomposing roots, rancid oil cake, littering on mouldy leaves. The milk of old cows sometimes has a bitter taste, which is difficult to account for.

The remedies are aromatic bitters and salt, with magnesia, calcium and potash derivatives.

These are some of the chief defects met with by us in cattle practice, and a short summary of them may be of interest and benefit to our readers. We shall be glad to receive any communications on the subject from those engaged in cattle practice.

SODIUM SULPHATE EXSICCAT.

By W. LOTHIAN, M.R.C.V.S,
Duns.

Some of the veterinary profession are anxious for a substitute for linseed oil. This winter I have used, in many cases of colic, sod. sulph. exsic. with very good results and far more satisfaction than linseed oil: 6 ozs. (exsic.) dissolved in a quart bottle of warm water. This may not purge, but it renders the bowel contents easy to pass along. It agrees well with horses in these cases, is not nauseating, nor leaves the mouth in a dirty condition; in fact cleans it, and takes effect quickly. Two or three cases I had where the pulse got up rapidly, and breathing was affected, as if hardened ingesta had accumulated about the flexures of the colon, with some irritation, The sod. sulph. moved this on nicely, and next day the animal was greatly improved or wholly better.

I always carry one or two packets with me, and consider it so very much superior to linseed oil in all respects that I would not now use the oil at all. One never sees that sickly, nauseating, paralysing effect in bowel cases which one sees after administering oil. In every respect I like it better; and another merit it has which I, as a true Scotsman, must not omit to mention—that of *cheapness.*

In all the cases one dose answered the purpose, but another dose could be given next day. Of course, unlike whisky, don't repeat in an hour; wait till next day.

THE CONTROL OF LICE ON HORSES, WITH ESPECIAL REFERENCE TO WINTER CONDITIONS.

By Maurice C. HALL, Ph.D., D.V.M.,
Parasitologist, Research Laboratory, Parke, Davis & Co., Detroit, Michigan, U.S.A.

In a previous paper dealing with horse lice, the writer (Hall, 1917) has noted that the problem of keeping horses free from lice becomes acute during the winter in the Temperate Zones whenever horses are exposed to infestation during part or all of the year. In the same paper some notes on the bionomics of lice were given, and some experi-

ments along the line of control were mentioned, but not discussed. The object of this paper is to give the results of these experiments and some others.

The writer has recently encountered the idea that lice were formerly rather rare on horses in this country. Dr. E. M. Houghton, of this laboratory, states that he never saw them on horses during his boyhood on a farm. I am informed by my father that in all his experience as a cavalryman in the United States Army in Arizona he never saw lice on cavalry horses. On the other hand, the editor of an agricultural paper stated in 1916 that lice were often found on horses and mules in olden times, but are now seldom seen. Whether or not lice were more or less common in this country during the Civil War, and for some time thereafter, they are certainly sufficiently common pests at the present time. Among the horses purchased for the serum work of this company quite a number are found to be infested with lice. The same is true of horses being purchased at the present time for our army, as requests for information as to control measures indicate.

The control of lice in summer is a comparatively simple matter. Two treatments with a coal-tar dip, at 20-day intervals, afford a cheap and adequate treatment without toxic effects on the horse, injury to the skin, or loss of hair. But winter weather is not suitable for this treatment under most conditions. The use of an aqueous solution of any sort chills the animal and increases the likelihood of pneumonia; the dip wets the horse, and wetting causes chilling. At times the objection may be overcome, as it is largely a matter of labour available to dry the animal after treatment. It is feasible to use coal-tar dips in winter, and to protect the animal against subsequent bad effects, where there are only a few animals to handle, or where there is an abundance of available assistance, as is the case in the army under ordinary conditions. The armies of the Allies, according to Haas, have dipped horses in a swim vat throughout the winter, the animals being dried and blanketed in a warm room when it was available, or being blanketed and taken to the stables when no such room was available. Something of the sort has been successfully accomplished under the direction of Dr. R. H. Wilson with the horses on serum production at Parkedale. This is a possible but not always attractive solution of the louse problem; it is not always a feasible solution.

Broadly speaking, insecticides may be applied to horses in one of five ways:—

(1) In aqueous preparations, which will wet the skin.

(2) In volatile preparations, which will evaporate, wetting the skin only transiently and drying quickly.

(3) In fatty or oily preparations, which will oil the skin, but not wet it.

(4) In powders, which will not wet the skin.

(5) In fumes, which will not wet the skin.

A good insecticide should be effective, cheap, easy to apply, cleanly, non-toxic to the animal, non injurious to the skin, and should not cause depilatory effects.

A discussion of the advantages and disadvantages of the methods given above, and notes on experiments with some of them, are given in the following portion of the paper.

(1) Aqueous preparations, such as coal-tar dips, are very satisfactory forms of treatment in summer, when wetting is not disadvantageous. In winter they must be used for choice on warm days, or in sheltering structures, and the animals should be quickly and thoroughly dried, rubbed down, and blanketed. Failure to provide this care in winter may result in pneumonia. This is the best known and best established method of killing lice on horses, and is the method of choice wherever applicable. Since it is entirely satisfactory in summer and not in winter, eradication dipping in summer may be regarded as the best treatment for lice; this avoids the aggravated effects of lice infestations, and the apparent increase in number, together with the increased difficulties and danger to treatment in winter. With two dippings at suitable intervals (twenty days), dips of this type are satisfactory on practically all of the counts noted as desirable for an insecticide.

(2) Volatile preparations for killing lice are seldom used or recommended, but since they can be used in winter, owing to prompt evaporation, and since so little has been published along this line, the writer made some tests to ascertain at first hand some of the possibilities of such treatments.

Of the volatile substances, two which deserve early consideration as louse-killers are kerosene and gasolene. These substances have proved extremely effective against lice on man, and have been used undiluted with very little resultant dermatitis. They are comparatively cheap and easy to obtain. However, kerosene is inflammable, and is notoriously depilatory and irritant for horses, and gasolene is too inflammable and explosive to use around stables where hay and straw in abundance furnish material for a conflagration. Tests of kerosene mixed with equal parts of linseed oil were made on one horse, No. 2; no live lice were ever found on the horse in examinations during a month after treatment, but the linseed oil did not prevent the depilatory action of the kerosene or the production of dermatitis. A substance which is not depilatory and not explosive, though it is

inflammable, is methyl alcohol (wood alcohol). This is known to have lethal and toxic properties, is easily obtained, and is comparatively cheap. It was therefore made the basis of most of the preparations tested.

The first of the methyl alcohol preparations tested was made by adding fluid extract of quassia (*Picrasma excelsa*) to methyl alcohol in the proportion of 3 ounces of the fluid extract to 30 ounces of alcohol, or 1 part to 10 by volume. The horse was sponged twice from head to tail with this preparation, and gone over with a brush each time immediately after sponging. A number of the horses treated in this way had been rubbing, but no lice could be detected on them; others had lice, but were not critically examined after treatment, so that no conclusions as to efficacy could be drawn; but a number of animals found infested with *Hæmatopinus* were treated, and were subsequently examined to ascertain the efficacy of the treatment. Eight horses (Nos. 484, 517, 400, 601, 283, 409, 730, and 471) were treated for lice, though in some cases no lice were detected in spite of a history of the animal's rubbing itself; these animals were not subsequently examined for lice, though casual examination in some cases indicated that the animals' coats were not injured by the treatment. Eight other horses (Nos. 173, 69, 746, 610, 57, 310, 706, and 457) were treated in spite of the fact that no lice were found on them; subsequent examination also failed to detect any lice, so no conclusions as to efficacy could be drawn; the animals' coats were not injured by the treatment. Eight others (Nos. 278, 491, 1,781, 452, 306, 677, 175, and 449) were found to have lice on preliminary examination, and were examined for lice after treatment. The results were as follows:—

Horse No. 278 had many lice. For several days after treatment dead lice were noticed on the animal, and an examination on the ninth day after treatment disclosed only one live louse. Fourteen days after the first treatment a second was given. Thirty-six days after this second treatment the animal was carefully examined, and no live lice were found.

Horse No. 491 had many lice. Nine days after treatment no live lice were found. It was examined again fourteen days after treatment, and no lice were found. The treatment was repeated on this day. It was examined twenty-one and thirty-six days after the second treatment, and no lice found on either occasion.

Horse No. 1,781 had lice. Thirty-eight days after treatment no lice were found.

Horse No. 542 had many lice. Twenty-one days after treatment no lice were found. Thirty-six days after treatment one live louse was found.

Horse No. 306 had many lice. Twenty-one days after treatment one young louse was found. Thirty-six days after treatment none were found.

Horse No. 677 had many lice. It was examined twenty-one days and thirty-six days after treatment, and no lice were found.

Horse No. 175 had lice. It was examined twenty-one and thirty-six days after treatment and no lice found.

Horse No. 449 had lice. It was examined thirty-six days after treatment and no lice found.

Of these eight horses, five had large numbers of lice, and three were lousy enough to make the finding of lice on them before treatment an easy matter. In eleven examinations after treatment no lice were found ; in two examinations, at intervals of twenty-one and thirty-six days after treatment, one louse was found in each case, one of them being evidently a young louse which had hatched subsequently to treatment. This appears to be conclusive evidence that the treatment will kill lice present on the animal. It is possible that the treatment exerts a detrimental effect on the louse eggs, but it is evident that as administered some eggs escape this effect and hatch. Probably two treatments at a twenty-day interval, if properly given, would completely free a horse from lice, so that it may be regarded as a fairly satisfactory control measure for lice in winter where dipping is not feasible.

A second methyl alcohol preparation was made with methyl alcohol as a base and contained 10 per cent. fluid extract of quassia, as in the foregoing preparation, and also 5 per cent. glacial acetic acid, and 1 per cent. coal-tar creosote oil. Two horses, Nos. 339 and 1,218, were treated with this preparation. No lice were found at the time of treatment, or seven or forty days after treatment, so there were no conclusions as to its efficacy, but the treatment had no bad effects on the animals or on the skin or hair.

A third methyl alcohol preparation was made with 20 parts methyl alcohol, 2 parts glacial acetic acid, and 2 parts coal-tar creosote oil. Two horses, Nos. 55 and 396, were treated with this preparation as follows :—

Horse No. 55 had many lice. Seven days after treatment it still had many lice and the coat was roughened. Thirteen days after treatment, it still had many lice, and was then treated with plain methyl alcohol. Twenty-seven days later no lice were found on examination, and the coat was smooth. The methyl alcohol to which other ingredients had been added, as noted, seemed inferior to methyl alcohol alone and exerted an injurious effect on the coat.

Horse No. 396 was examined for lice, but none were found. It was

given the same treatment as was given No. 55 the first time; seven days later no lice were found, but the coat was rough. Forty days after treatment no lice were found, and the coat was again smooth. No conclusions as to efficacy in this case.

The mixture used seems to be unsatisfactory as regards efficacy and effect on the coat.

A fourth methyl alcohol preparation was made with 400 parts methyl alcohol, 20 parts glacial acetic acid, and 5 parts coal-tar creosote oil.

Eight horses were treated with this as follows :—

One horse, No. 24, was examined for lice, but none were found. It was given the treatment noted above. Seven days later no lice were found, but the coat was roughened. Forty days later no lice were found, and the coat was smooth.

Seven horses had lice and were treated with the above preparation with the following results :—

Horse No. 709 had lice. Seven days after treatment no live lice were found, but the coat was roughened. Forty days after treatment, one live louse was found; the coat was smooth.

Horse No. 312 had lice. Seven days after treatment no lice were found, but the coat was roughened. Forty days after treatment no lice were found, and the coat was smooth.

Horse No. 303 had lice. Seven days after treatment a young louse and one older louse were found. The coat was roughened. Thirteen days after treatment one young louse was found. About this time the treatment was repeated. Forty days after the first treatment the horse was examined and no lice found; the coat was smooth.

Horse No. 9 had many lice. Seven days after treatment no lice were found. The coat was roughened. Forty days after treatment two lice were found. The coat was smooth.

Horse No. 490 had lice. Seven days after treatment no lice were found. The coat was roughened.

Horse No. 365 had lice. Seven days after treatment no lice were found. The coat was roughened.

Horse No. 1,758 had lice. Seven days after treatment no lice were found. The coat was roughened. Forty days after treatment two lice were found. The coat was again smooth.

In the foregoing tests of this fourth methyl alcohol preparation, six of the seven horses had lice enough to find easily, and the seventh had a heavy infestation. In thirteen examinations after treatment no lice were found in eight examinations; one louse was found in each of two examinations, and two lice were found in each of three

examinations. Of the eight lice found after treatment two were evidently young lice, and it is quite possible that some of the other lice had hatched after treatment. The coat was rough a week after treatment and smooth forty days after treatment.

In the cases already noted in this paper, the lice were *hæmatopinus*. *Trichodectes*, as already noted (Hall, 1917), was only found on two horses, in both cases in heavy infestations. The lice were destroyed on one horse, No. 772, as previously published, by the application of sodium fluoride. The other horse, No. 773, was sponged, as described, with methyl alcohol. Fifteen days after treatment no lice were found.

Sponging with methyl alcohol, alone or with the addition of fluid extract of quassia, or of glacial acetic acid and coal-tar creosote oil, is a fairly effective control measure for lice on horses in winter. It must be applied thoroughly and carefully, but if so applied it is likely that two treatments at a suitable interval, twenty days, would completely free a horse from sucking or biting lice. The methyl alcohol is somewhat unpleasant to handle, and the fact that it is inflammable must be kept in mind.

(*To be continued.*)

Clinical Cases.

By Henry B. EVE, M.R.C.V.S.,
Folkestone.

NOTES OF A CASE OF LACERATION OF THE SACRO-ILIAC ARTICULATION IN THE MARE.

The above case occurred in my practice some time ago, which shows the peculiar characteristic recumbent posture. I found the animal on arrival dead.

The history of the case is that it had arrived all right by train overnight, unloaded here, and was put into a loose box to be fed and watered, previous to being shipped to France. Nothing was noticed amiss with it by the attendant; when he found it dead, to his surprise.

I had it photographed and made a *post-mortem*, which revealed the fact that it suffered from aneurism of the post aorta, which had ruptured and caused death.

Having seen the diagram of Capt. H. R. Routledge's, F.R.C.V.S., interesting cow case in journal reminded me of the occurrence. I remember a similar case in a cow appeared illustrated in "Record"

ANEURISM POST AORTA.

Rupture of Post Aorta, cause of death—*P.M.*, see *Record.*
Luxation of the Sacro-Iliac Articulation in the Brood Mare.

by Henry Taylor, F.R.C.V.S., Haywards Heath, September 14th, 1912. I sent the latter a photograph of my case, and he gave me one of his cow in return, and we exchanged notes on the cases.

AMPUTATION OF THE TAIL.

Subject.—A Great Dane, the property of an officer on active service, which suffered frequently from a sore at the tip of the tail which defied all antiseptic treatment with lotions and various dressings as a result of the coccygeal bones being diseased, so tried amputation.

History.—The bitch I knew as a pup, having attended the mother at pupping, which also suffered from the same complaint, which is difficult to treat in my experience, and indicates that the disease is apparently "hereditary." The owner had tried various dressings—"Zambuk," declared by some a specific. It always healed up for a time, and then broke out again; the dog continually licked the parts, bit them raw, and banged its tail against furniture, doors and kennel (padded with sawdust).

Diagnosis.—Bones (coccygeal) diseased; advised amputation; owner wished treatment to be tried first, and was very persevering

and patient; but consented finally to the operation, which would spoil her appearance, and render her liable to disqualification at shows.

Treatment.—I cleansed the wound with chinosol solution, and dusted over iodoform, starch, boric acid, and zinc oxide; covered sore with gauze and bandage applied, which was kept on with difficulty, although I applied several layers of Mead's plaster over the end of tail to prevent further bruising. I also ensheathed the tail in a case of leather, which was fastened round the loins. It healed again and again, and always broke out, so I decided to try amputation.

Operation.—I applied (locally) cocaine with adrenalin and boric acid (Parke, Davis & Co. tablets dissolved); ligatured and amputated (with horse-docking machine) at the joint above disease, and seared the dock well with hot irons, which I had to do to control the "hæmorrhage" which was somewhat extensive, the patient apparently being a hæmophilia subject, and very neurotic ever since the air raids. Locally, adrenalin strong solution did not appear to have any effect at all, or ferri. perchlor, so I kept a ligature on (elastic tourniquet) above the seat of operation for some time, and finally removed this and applied iodoform colloid. To prevent her antics, I put on an Elizabethan collar and leather case, which answered well. The bitch has recovered, (wound healed by primary union), and bears me no malice. In addition to the collar, etc., I tied her to the centre of a rope, placed across the bedroom where she was quartered, allowing rope enough to lie down without being able to reach the hind quarters, which was necessary.

EPILEPSY CAUSED BY PARASITIC CYSTS IN THE BRAIN OF A DOG.

Subject.—Samoyede dog, two years old.

History.—The animal had suffered periodically from epileptic fits, which made the owner suspect either "rabies or poison," as it had been dosed several times for worms, and had been declared by a graduate free from them. The dog was in the habit of carrying stones in its mouth, which the owner said he could not break it of unless it always wore a muzzle. The dog had recovered from distemper, twelve months previously and had been attended by a V.S.

Symptoms.—I observed the animal moved in a happy-go-lucky, clumsy sort of fashion, and showed symptoms of "hemiplegia" on the right side. It had a fit in my surgery, and the usual paroxysms were manifest, accompanied by foaming at the mouth, etc.

Prognosis.—Unfavourable.

Diagnosis.—Perhaps epilepsy, due to reflex irritation caused by foreign body in the stomach, or worms, or "cysts in the brain."

Treatment.—Gave hypo. inj. apomorphine as an emetic, which acted quickly, and a mass of debris, composed of bones and matted hair, was vomited. Gave internally bromide compound (elixir) (Parke, Davis & Co.) pot. bromid., chloral hydras. and ext. cannabis indica and ext. hyoscyamus, as a sedative and suitable diet of a liquid nature, which relieved the animal temporarily. Put the dog later on a diet of raw meat minced and tripe, and administered a tonic of hydrated iron 1 gr., and arsenic 1-30th gr. in food; sent little anti-leptic pills, tinc. valerianate 1 gr.; zinc. bromide ¼ gr., arsenic bromide ¼ gr., to be given periodically as a preventive of fits.

Remarks.—Dog discharged from infirmary, brought back as a result of a street accident (run over by motor, and severely injured), paralysed. Advised destroyal, to which the owner consented. I made a post-mortem, which was interesting.

Result.—No fracture anywhere present, but a "cyst" was found in the anterior lobe of the brain, and several others of small dimensions in the brain substance, and on its lower surface. These all had the characteristic appearance of the cysts of the "taenia cellulosa" variety of man.

General Articles.

AN EAST COAST FEVER EPISODE.

By "H."

It was in March, 1916, that I first became acquainted with East Coast Fever. It was in this wise: There were two of us, "H. K." and myself, and our immediate object in life was to get a mob of about 500 cattle up to German East Africa, where they were to serve as food for General Northey's force. We had left Fort Jameson, in Northern Rhodesia, towards the end of February, crossed into Nyasaland to avoid the huge "fly-belts" that constitute the greater part of the former country, and were making our way northwards. During the first three weeks our journey was made under favourable conditions, despite the fact that it was in the rainy season. Our way lay through pleasant bush country, sparsely populated by natives, and, save for rare administrative "bomas," mission stations, and hunters' camps, altogether uninhabited by white men.

Our journeying was done thus: Breaking camp by starlight, we were on the road before the sun appeared. "H. K." and I would walk on ahead, preceded by a guide, and attended by our gun-boys. Some distance behind would trail our porters, fifty of them, carrying on their heads the equipment and provisions necessary for a three months'

sojourn away from stores. Behind these, again, and travelling yet slower, came the cattle. The first mob was composed of big bullocks ; the smaller and weaker animals following in lots of a hundred strong. As we walked along we would pause from time to time to fill in with our sticks any deep, narrow hole on the path—such as are caused by termites devouring tree-roots—that was likely to cause lameness should an ox be forced to put his foot into it.

We used to try and arrange to cover about 10 miles a day, and as it was the rainy season we were generally able to accomplish our desire. Had we been travelling in the dry season we should have been forced to put in some very much longer treks between the water holes. About 9 a.m., then, we would begin to look out for a camping place. The desiderata were good water accessible to cattle, good grass and a sufficiency of small trees for kraal building. Having selected a site for our camp, we would possess our souls in patience until our porters arrived. We would then mark out the sites for our tents and kraals. The latter were made on a sloping ground to allow for drainage, and were laid out on the plan of a rectangle divided into as many compartments as there were mobs. To make them, our porters, having deposited their loads, would cut and insert forked poles to serve as posts, across which they would lay and bind thin poles. The lashings were made from the inner bark of certain species of trees. Against the fence thus formed were piled all the branches lopped off from the poles. Our tents were pitched on the top side of the kraals, and the boys were then set to build themselves grass shelters at intervals round the other three sides. By the time the camp was completed the cattle would have arrived, and we would have pointed out to the herd-boys the most suitable grazing-grounds. Thus it was usually after eleven o'clock before we sat down to breakfast. After that meal we would lounge and read, or perhaps fill in time by walking to where some of the cattle were grazing, until 3 o'clock tea was served. As a rule, after that, one of us would go out with rifle or gun, while the other would stay behind to count the cattle into their kraals at sunset. A hot bath followed by dinner left only a short time for smoking before drowsiness suggested bed. Rarely were our slumbers disturbed by anything more menacing than the usual sounds of restless cattle, but, as there are always lions somewhere in the vicinity of cattle travelling through Central Africa, we kept fires burning throughout the night, if possible, and our rifles lay near our bedsides.

Travelling about six days a week, and, when a particularly favourable place was reached, resting the cattle on the seventh, we pursued the even tenor of our way for about 250 miles. Then our troubles began. We had now entered a district densely populated by natives

so that it was very difficult to find any camping-place away from ground soiled by herds of native cattle. If we were to get our charges, safely through to their destination it was essential that we kept away from indigenous herds ; because throughout the whole of Northern Nyasaland East Coast Fever is enzootic, and our cattle were susceptible to this disease.

When East Coast Fever is enzootic in a district the situation is this : All the adult cattle one sees are immune to the disease, but each young calf must sooner or later—depending on the tick population—go through an attack. The majority of calves survive, though perhaps 20 per cent. die. All these sick calves act as reservoirs of the virus and serve to infect more ticks ; consequently clean, non-immune cattle passing through the district are in grave danger of picking up infective ticks, and the mortality among such infected cattle is nearly 100 per cent.

We did our best, but nevertheless our apprehension grew. Then came the day when we reached the Rukuru River, and found it impassable for stock. We cast about and camped at a spot as far away from villages as we could find, but 500 head require a lot of veldt to graze over, and we knew they must of necessity encroach on infected land. Meanwhile we set to work to bridge the river. We found a spot where it ran between great ranges of hills, flowing very fast and deep. A great boulder lay in its centre, and already the natives had thrown a slight pole bridge across the two channels. It took us two days to strengthen this structure sufficiently for it to bear the weight we were about to impose on it, and we bounded it with leafy rails to hide the water from the sight of the animals while they were crossing. Then, one Sunday morning, we essayed to get the cattle across.

To get to the bridge one had to proceed along a narrow path that wound through the hills, but by this time the cattle would travel quietly in single file, each mob having one or more adventurous leaders that were always ready to go ahead. Where the path debouched on to the bridge-head the noise of the waters was deafening and calculated to frighten any beast. We had with us an old white donkey, a great traveller, and fearful of no obstacle ; him we had led at the head of the first mob, because we knew he would venture across, and we hoped the cattle would follow the lead thus set. Even if the animals crossed the bridge itself there were other physical difficulties to be contended with. The path leading to the bridge was bad, but that going from it was worse. In the first place the bridge led on to a large, flat rock, and the commencement of the path was two feet above this ; to attain it one had to step or leap on to a large boulder. We had arranged that " H. K." should supervise the getting of the cattle on to the bridge,

while my task was to be that of getting them on to the path on the other side.

At last the old donkey, led by a boy, appeared, and close behind him came the first of the oxen, sniffing his way cautiously along. The donkey gave no trouble at all, but walked straight on to the bridge, and to our relief the leading ox hesitated but a minute before following. After the leader came some others, and soon the flat rock on the far side was covered by a mass of beasts, for, though "H. K." had succeeded in his task, I had failed in mine, and, despite the gallant lead set by the donkey, the oxen jibbed at the boulder, refusing to jump on it, and turned back to mingle with those still crowding across. We were naturally frightened that if once we stopped the stream of cattle that was pouring across the bridge we should have a job to restart it, so I redoubled my efforts, using my sjambok mercilessly; but all in vain, and I shouted and gesticulated until "H. K." took notice, and blasphemously stopped more cattle coming on to the bridge. He then came across, and our united efforts at last succeeded in persuading one beast, soon followed by others, to jump on to the boulder. After that the interrupted stream of cattle was again set in motion without much trouble, and two hours later all were safely across.

For about a mile beyond the boulder the path ran its narrow course alongside the hill that bounded the river, in many places there being a sheer drop of about 30 feet into the rushing water below. Along this path the cattle travelled in single file, and fortunately none stopped or tried to turn back; if they had, those coming behind would have mobbed, and some weak ones would have gone over the edge. As it was, one animal did fall over the brink, and perished in the water. The natives have some superstition to the effect that the spirit of the place demands a gift of all who go by, and I believe they thought that the drowned ox was the sacrifice claimed by the spirit for our passsage.

As we counted the cattle into their kraals that night we imagined that the worst of our troubles were over, and calculated that in a month's time we should have delivered our charge. For the moment we forgot about East Coast Fever, and made plans for travelling slowly, in order to preserve the animals in the splendid condition that they were then in.

The greater part of Nyasaland north of the Rukuru is a great plateau, called the Nyika. It is a country of rounded hills, grass-clad, and intersected by numerous swift-flowing streams. The average height of the plateau is, I suppose, somewhere about 6,000 feet, although some of the hills attain a considerably greater altitude.

The usual route for travellers taking the journey we contemplated

is along the path through the strip of Nyasaland that lies west of the plateau, between it and Rhodesia. A week's travel along this path would have brought us to a point on the border of the two countries that lie north of the great fly-belts, and we could then have crossed into Rhodesia and been only 150 miles from our destination. On the day following our crossing we advanced into the foot-hills on the south side of the plateau, and came on a place eminently suitable for a short stay. There was an abundance of grass and water, and the buffalo spoor in the native gardens gave promise of sport for ourselves, so we decided to remain a day.

Next morning the cattle as they came out to feed looked splendid, without a sick-looking beast among them. Three hours later, while we were breakfasting, a herd-boy came to say that an animal was ill, and he brought us to a half-grown ox that stood dully, not attempting to feed. It had a high temperature, and a noticeable feature was a swelling under an ear due to enlargement of one subparotideal lymphatic gland. This lesion is a common, but by no means invariable, one in cattle affected with East Coast Fever. By night the beast was destroyed when *in extremis*, and a gland smear taken. The following morning two more oxen lay dead in the kraals when the others came out, and a third was sick. Microscopical examination of stained gland smears showed, in each instance, numerous Koch's bodies, and the disease stood revealed as East Coast Fever.

We had now to consider what was our best course. We were uncertain whether we were still in a district where the disease was enzootic; but, whether we were or were not, one thing was certain—we must not go anywhere near native cattle from now onwards, lest these, being clean, were infected by our diseased animals, or, being infected, they infected still more of ours. We had not the slightest notion how many of ours were now incubating the disease; perhaps but a few, perhaps the lot. Knowledge of the etiology of the disease suggested that if we got on to clean veldt, and changed our grazing ground every week, no more cattle could become infected, and those that were incubating the disease would show it within three weeks.

The route spoken of above was now closed to us, because of the native cattle along it, and the only veldt available where we could fulfil the conditions necessary for cleansing the herd was the plateau itself. Next day we started to climb on to it—1,000 feet up, then 500 down, then up another 1,000, and so on. Two strenuous days brought us to the top, and the cattle must have lost a good deal of weight from the climb. During these two days three or four more animals died or were destroyed.

Now commenced three miserable weeks. Each evening, whether

we had been travelling or halted during the day, when the cattle came in at night we would ask the guards how many more were ill, and inevitably a few beasts would be pointed out as off feed. Any beast obviously ill, and having a high temperature in the morning, was destroyed. I say "high temperature in the morning" because in the tropics the temperature of a *healthy* ox may exceed 105 in the evening of a hot day, owing, I suppose, to the inability of bovines to sweat freely. On the days when we travelled I would walk behind the last herd, armed with a native axe wherewith to destroy any poor beast that fell by the wayside, for not infrequently a beast would leave its kraal apparently fit and yet, three hours later, refuse or be unable to climb a small hill. It was a heartrending business.

The country was cold, wet, and desolate. Our boys were complaining that their exclusive diet of meat and green mealies disagreed with them; several were ill with fever, and almost all suffered from a loathsome skin disease. A favourite dog contracted biliary fever and died. Even the old donkey, after fifteen years' residence in the tropics, sickened almost to the point of death.

It was during this stage of the journey that I witnessed one of those incidents that make us realise how little we understand the native. The African negro has the disposition of an unlovable child, that at the best inspires in his master a sort of pitying affection; nevertheless one day I saw our chief herd-boy on his own initiative pick up a poor, sick fellow who was toiling painfully up a steep hill, and carry him to the summit.

The physical difficulties to be overcome were not trifling, rivers especially being a nuisance. Either they would be fordable, but with banks so sticky that the cattle became bogged, or else they would flow too fast for the animals either to wade or swim through, and we should have to build bridges. It is not often that I have felt as "fed up" as I was one night. We were in a particularly sterile part of the plateau, where the grass was of the sourest. We had been held up by a river of which the banks were so steep that the cattle were unable to water at it, but had to drink at rain pools. We had spent the afternoon putting up a bridge; a very rough affair, for by now the cattle would walk across a few poles, provided these would bear their weight. That night, as the cattle came in, there were about eight sick, and, as we were leaving next day, we killed them and left their carcases lying close to the kraals. The country being very sparsely inhabited, there were no local natives to devour this good beef; it just lay and rotted. Well, on this particular occasion we were no sooner settled for the night than it commenced to rain. I have said that the district was a sterile one; accordingly our boys

were ill provided with grass shelters, and we knew the poor beggars were lying or sitting around embers that were being quickly quenched. The thought of the plight of our poor followers would have been sufficient to keep me awake during that wretched night, but a further cause of unrest was furnished by a dose of fever—one of those sub-acute attacks that do not actually incapacitate a man, but that make him feel wretched and depressed, with a hot, dry skin. As I lay awake, listening to the pitiless beating of the rain on my tent, I remember thinking that the only thing necessary to complete our discomfort was the stampeding of the cattle by a lion. However, no such catastrophe occurred; morning dawned clear and beautiful, and the sun's rays soon dissipated moisture and depression.

It was just a fortnight after our climb on to the plateau that the daily death rate became highest, showing that it was while we were held up by the Rukuru that the greatest number of cattle became infected. Since the first beast died we had lost nearly 150 head, the worst day being one when I killed forty animals, including many big, half-bred oxen. The incubation period for East Coast Fever is twelve to twenty days, so when we had been on clean veldt three weeks the animals ceased to go down, and unless there were among them a few of those rare cases in which the incubation period lengthens out to several weeks, we felt that we had now a clean herd.

Our path during this time had taken us in a north-westerly direction across the plateau, so that we could now almost look down on to Rhodesia. Of course, after recent events, we could only cross the border with the consent of the C.V.S. of that country, so it was necessary to put the cattle in quarantine on the border until such permission could be obtained.

Of the further trials that befell us—as when, for instance we reached the actual border only to find an unexpected fly-belt there; unable to cross the border on account of restrictions; unable to go back on account of the East Coast Fever; and unable to stay where we were on account of tsetse fly—they would make too long a story to be told now.

ARMY VETERINARY SERVICE.

THE ECONOMIC AND MILITARY NECESSITY OF AN ARMY VETERINARY SERVICE.*

COLONEL J. J. AITKEN,

British Army Veterinary Corps, Washington, D.C.

SINCE the United States ran her battle-flag alongside those of the great civilised nations to the masthead of the battle-ship "HUMANITY," with the sworn object of fighting and exterminating that lawless, piratical craft "BARBARISM," manned by those followers of Attila, the Central Empires—since that day the subject that has been uppermost in my mind, and doubtless also in the minds of many, if not all of you, has been, How can the profession we have the honour to represent do best service in this great crusade of to-day?

This crusade, as it has developed in magnitude, has shown itself to be one that calls for the very last ounce of organisation and of physical and mental energy.

In the fighting zones, in all its activities it is a war of trained experts, working in perfect co-ordination. This we know from personal experience, from the reports of eye witnesses, or from the Press.

The veterinary profession in this great land of freedom, at this critical moment of its history, can be of most use to its country in producing an organised veterinary service as part of the U.S. Army.

Such a service, to be effective, will require to be as much a part of the army as are now cavalry, artillery, and infantry; a trained disciplined service of officers and enlisted men organised into veterinary units of various kinds with specific duties to perform. The necessity for an organised veterinary service in an army of to-day is two-fold. There is an economic necessity and there is a military necessity. This great crusade is using up so much of this world's wealth and material that the old slogan of "The Best and the Most at any Cost" has been superseded by "The Best and the Le t Necessary at the Smallest Cost." We must not forget that all of us who rally round the old cry, "Be it by ourselves wasting, encouraging waste in others, or even not preventing, to the best of our ability, waste of foodstuffs, raw material, transportation or horseflesh, are materially assisting the common enemy." The economic necessity of a veterinary service as part of an army of to-day lies in the fact that it is only by the existence of such an organised, centrally controlled service that commanding officers of combatant units can have placed

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*Read at the 10th Veterinary Conference, Ithaca, D.Y., January 11th, 1918. (From the *Journal of the American Veterinary Association.*)

at their disposal, as advisers on all matters affecting the health of the animals of their units, capable veterinarians, working under an organised, co-ordinated system. Without such advisers, economy in horseflesh cannot exist. This will be patent to all if they will consider for one moment the multiplicity of duties of the combatant officers of to-day and the limited knowledge of horseflesh that many newly-commissioned officers possess.

It is only by an organised veterinary service that faults in animal management, common even to-day and to become increasingly common as men less and less acquainted with animal management are necessarily drafted into mounted branches, can be brought to the knowledge of the headquarters of formations, armies or the war department in time to prevent serious results; it is only by such a service that co-ordinated steps can be taken to rectify such faults.

Without such a service delay in diagnosing, in reporting, above all delay in taking co-ordinated and organised steps to control and eradicate equine contagious disease must result, with appalling loss of efficiency, waste of public money, labour and material. Without such a service the expensive treatment of sick, lame and injured animals haphazardly, without proper appliances and with an untrained staff in their own lines or in hopelessly situated, equally hopelessly equipped so-called veterinary hospitals, must continue to exist. With such a service, however, all but the most minor cases can be treated in bulk, by the thousands instead of by tens and hundreds, in large, well-built, properly-ventilated, properly-situated, thoroughly equipped and efficiently staffed veterinary hospitals.

It does not require much considering to realise that in such hospitals it is possible to provide specialists, appliances, trained staffs, and a system that it is utterly impossible to provide for hundreds of small so-called hospitals that exist when no organised veterinary service is in being, nor is it difficult to realise that one system is criminally wasteful and the other economical.

Without such a service co-ordinated steps cannot be taken to collect reports and obtain information on the hundred-and-one matters affecting animal health in a military service, nor to investigate outbreaks of disease and the frequency of injuries affecting animal efficiency. Without such a service scientific investigation and experimental work with a view to eradicating harmful courses must be inco-ordinate and wasteful.

Without such a service no efficient control can be exercised over young and inexperienced veterinarians; no adequate support can be given to those veterinarians who, in the performance of their duties, find difficulties placed in their way. No system of praise for the

silent, conscientious hard worker, blame for the bluffer, and elimination of the vicious, the ignorant and the pseudo-veterinarian, can be created.

The reasons I have just outlined to you showing the necessity for an organised veterinary service all have an economic "*raison d'être.*" In that they affect efficiency, however, they are also military reasons. There are also a few purely military reasons that show the necessity for an organised veterinary service in an army of to-day. The efficiency of a mobile unit depends largely on the efficiency of its means of mobility, be such the men's feet, the mule, the horse or the engine-driven car. An organised veterinary service can materially assist military efficiency by removing, with the least loss of the fighting strength of a unit, all animals that retard mobility, either by their inability to move at a normal pace or by their presence on the feeding strength of a unit when in an unworkable condition, a presence that is a high factor of inefficiency in that it is a cause of great loss of ton-mileage on already congested lines of communications often far up into the zone of operation.

The fact that all sick, lame and injured animals, excepting those suffering from disease and injury of the most trivial character, must be at once removed from units in the zone of operation is self-evident. Further, no one will dispute the fact that officers and men must be detailed to look after and restore to usefulness at the earliest possible moment these temporarily, from a military point of view, useless animals—to attend on them from the moment they become useless, be it from a shell wound sustained in the actual firing line, a kick sustained in the wagon line, or disease or injury acquired in any way. What branches of the service can look after these animals with the least waste of fighting efficiency? The officers and enlisted men of corps and units on whose expert training as cavalrymen, artillerymen, machine-gunners, mine-layers, bombers, bayonet fighters, medical students and quartermasters, time, labour and money have been expended? No, they are wanted and wanted badly at their own duties, not wanted for a few hours a day or for a few days a week, but all day and all the week.

These duties can only be performed economically and with least loss to the fighting efficiency of the army by an adequate military veterinary service, organised as a trained and disciplined entity, officered by its own officers, ranking according to the appointments they are elected to fill, with grades equivalent to those of the holders of similar appointments in other branches of the army. A service with one object and one object only in front of it, "EFFICIENCY."

Translation.

MAL-DE-CADERAS.

EMETIC FOR THE TREATMENT OF DERRENGADERA (MAL-DE-CADERAS). FIRST INVESTIGATIONS—DOSIFICATION—PRELIMINARY TESTS—APPLICATION ON A LARGE SCALE.—(*Medical Gazette of Caracas*, March 31st, 1918; No. 6. Works executed at the Laboratory of Doctor Juan Iturbe.)

THE favourable results obtained by Van Saceghem (1915) by application of emetic on bovine species attacked with Trypanosoma cazalboui and the surprising effect of the same medicament in the cure of cutaneous and visceral leishmaniosis, has induced us to test the action of monatartrate acid of antimony and potash in the trypanosomiasis of the equine family known in the plains of Venezuela as derrengadera.

The virus we use in our applications was taken at the end of the year 1915 from infected horses of the plains which were brought to the "Jabillal" pasture of the outskirts of Cagua.

During the time elapsing from that date we have been able by successive injections to the animals at the laboratory to obtain a trypanosoma of a standard virulence; an intraperitoneal injection causes death of the guinea pig in ten days. In our experiments we have only made applications on animals which presented a great quantity of trypanosomes in the peripheral circulation.

By the dose of 4 to 5 mm. in the kilogram, the emetic intramuscularly or intravenously injected causes the disappearance of the trypanosomes contained in the blood in fifteen minutes. This action, really specific, was uniform on all the animals that were experimented on; notwithstanding the repeated hematological examinations we were unable to discover, during the days following the time of the injection of the sterilising dose, any example of the flagellates. The blood of the guinea pig, treated by the emetic, inoculated to another receptive animal a week subsequent to when the first injection was applied, does not contaminate the sickness; on certain occasions, however, on the third or fourth week from when the emetic was administered, relapses have been observed which yield to a new injection of the medicament. In case the reaction is serious and the bacteriological examination reveals a great amount of parasites, the dose should be increased; it is well to remember that there exists a chemical relation between the medicine and the causal agent of the disease.

The animals of the laboratory support well the subcutaneous or

intravenous injections of antimonio. By our tests an accident has never occurred that could be attributed to the compound.

It must be admitted that whereas none of the trypanosomes of the peripheral circulation escape the chemo-therapeutic action of the emetic there remain, however, parasites in the depth of the tissues that are not affected by this substance. To avoid reactions and obtain positive results it is necessary to effect several injections in order to carry off the fractional sterilisation as is done for the other sicknesses caused by protozoa.

The technical measures adopted for the compound of the emetic was that which on an occasion had already been recommended: Iturbe and Gonzalez (1917). The sterilisation is applied cold by passing through a Berkefeld filter.

The emetic used in our studies is that of the house of Baiss Bros., London, or Merck, of Darmstadt.

In view of the experimental results referred to, we endeavoured to effect tests on the equine animals attacked by the sickness; with this object, and aided by the intelligent co-operation of our distinguished colleagues, Messrs. Tagliaferro and Nuñez Tovar, five horses and two mules were injected on different occasions which had the typical symptoms of that sickness and presented a large quantity of trypanosomes in the peripheral circulation.

The dose used was 1 to 1·50 grams of emetic disolved in 100 *c.c.* of chloride solution at 4 per 1,000 in intravenous injections.

All the animals submitted to this treatment are completely cured, and the injection was given at regular intervals of five days without accidents occurring. Tagliaferro and Nuñez Tovar have been able to apply the solution concentrated at 1 : 40 without any disagreeable accident and with excellent therapeutic results.

At present injections are being given on a large scale, and a place has been founded where the infected animals are submitted to a cure by the emetic.

It is our opinion that this procedure, simple in its technicalities, and which is giving such efficient results, whilst contributing to save a considerable number of the equine animals annually affected by derrangadera, will do away with the losses which our breeders have suffered.

REFERENCES.

Iturbe and Gonzalez (1917).—First case of Leishmaniosis cutanea in Venezuela (*Journal of Parasitology*, September, 1917; Vol. IV, pp. 44–47).

Van Saceghem (1915).—Contribution a l'étude et au traitement des trypanosomiases. (Ministére Colonies de Belgique, Raport 1915.)—*Nuevo Diario*, Venezuela.

Correspondence.

To the Editor of THE VETERINARY JOURNAL.

DEAR SIR,—Some time ago you were good enough to publish in THE VETERINARY JOURNAL (July, 1916) a short note by me on "Coital or Vesicular exanthema in the Horse," in the subsequent September number Captain R. C. G. Hancock, B.Sc., A.V.C., contributed corroborative evidence of his experience of the disease.

Since then I have had further opportunity of observing the disease, which appears of less rare occurrence in Great Britain than one imagines by the slight reference to it which one finds in most modern text-books. The following brief outlines of a small outbreak, which occurred in my practice since 1916, may be of interest. Stallion A, which had not been previously used at stud before this season was seen to be affected. The horse had fifteen typical ulcers on one lateral surface of the penis, twelve on the other side, and a large, irregularly-shaped ulcer on the ventral surface; there were three typical ulcers on the prepuce.

A dose of aloes and calomel in the form of a ball and the daily washing of the parts with Eusol for a week was prescribed; subsequently, a solution of corrosive sublimate 1 in 3,000 was substituted for the Eusol. A mare with a healthy foal at foot, the property of another farmer residing in another parish, was found to be affected to a marked degree.

This mare had been served eight days previously by Stallion A and probably had been affected at least three days prior to the eighth day after service, because she and the foal were out at grass and they were not seen at a short distance by the owner or his men until the eighth day. Stallion B, two years old, purchased six days after the commencement of the treatment of Stallion A, from a farmer nearly 20 miles distant, deputised on part of the round of Stallion A. Stallion B did not serve the previously-mentioned diseased mare with foal at foot. Twelve days after the date of purchase Stallion B was found to have typical ulcers on his penis and prepuce. I ought to add this horse had not served a mare prior to date of purchase.

The question arises, was the disease conveyed by mediate or immediate contagion?

If by mediate contagion, did the owner of the stallions, who is also the stallion leader, convey the virus (?) to the younger horse through the medium of his hands during the act of serving a mare, the man having previously dressed the older horse's penis and prepuce.

On the other hand, is it feasible, in the present light of our slight knowledge of the etiology of the disease for us to presume stallion B contracted the disease from a mare which was apparently healthy?

The undoubted occurrence of this disease from time to time, at varying intervals in the county of Suffolk, is beginning to cause uneasiness in the minds of some local breeders; one influential breeder in this county views the disease gravely, and he goes as far as to suggest to me that drastic measures should be enacted under Mr. Prothero's Horse Breeding Bill, one of which would make notification of the existence of the disease compulsory by owners and veterinary surgeons.

Although the disease is usually benign in its course, and amenable to simple treatment, nevertheless, when an outbreak occurs at any time prior to the last week of a horse's round, it causes some dislocation of the horse breeding business in that particular district.—I am, Yours faithfully,

HORACE L. ROBERTS, F.R.C.V.S.

Ipswich, June, 1918.

ARMY VETERINARY SERVICE.

War Office, June 3.

The King has been graciously pleased, on the occasion of His Majesty's Birthday, to give directions for the following promotions in and appointments of the Most Distinguished Order of St. Michael and Saint George for services rendered in connection with the War. (Dated 3rd June, 1918) :—

To be Additional Members of the Third Class, or Companions, of the said Most Distinguished Order :—

Temp. Lt.-Col. Herbert Watkins Pitchford ; Lt.-Col. (temp. Col.) George Mostyn Williams ; Maj. (temp. Lt.-Col.) Frank Shelston Headon Baldrey, F.R.C.V.S., Ret. pay. ; Temp. Major, Jos. Wm. Forster Brittlebank.

CANADIAN A.V.C.—Lt.-Col. Charles McEachran.

Rewards for valuable services rendered in connection with the War. (Dated June 3rd) :—

TO BE BREVET LIEUT.-COLONEL.

Maj. (temp. Lt.-Col.) E. Brown, D.S.O.

TO BE BREVET MAJOR.

Capt. (temp. Lt.-Col.) E. E. Bennett, Ret. list (late A.V. Dept.) ; Capt. (actg. Maj.) A. B. Mattinson, M.C., F.R.C.V.S., Spec. Res. ; Capt. E. E. Seldon.

THE MOST DISTINGUISHED ORDER OF ST. MICHAEL AND ST. GEORGE.

For services rendered in connection with Military Operations in France and Flanders. (Dated June 3) :—

To be additional Members of the Third Class, or Companions of the said Most Distinguished Order :—

Temp. Maj. Fredk. Thomas George Hobday, F.R.C.V.S.

TO BE BREVET LIEUT.-COLONEL.

Maj. (actg. Lieut.-Col.) W. H. Nicol ; Major E. J. Wadley, D.S.O.

THE DISTINGUISHED SERVICE ORDER.

Temp. Capt. (temp. Maj.)F. C. Gavin ; Maj. H. J. Holness ; Maj. J. R. Steevenson.

CANADIAN A.V.C.—Maj. (temp. Lt.-Col.) A. B. Cutcliffe ; Maj. (Lt.-Col.) C. E. Edgett ; Maj. C. G. Saunders.

AUSTRALIAN A.V.C.—Maj. G. G. Heslop.

THE MILITARY CROSS.

Capt. (temp. Maj.) T. Bone; Capt. (temp. Maj.) A. L. Horner; Capt. D. Keir; Temp. Capt. W. Lenton.

CANADIAN A.V.C.—Capt. M. P. Kennedy.

AUSTRALIAN A.V.C.—Capt. C. R. Seelenmeyer.

For distinguished service in connection with Military Operations in Egypt. (Dated 3rd June):—

THE DISTINGUISHED SERVICE ORDER.

Capt. (temp. Maj.) Harry Edwin Powell; Capt. (temp. Lt.-Col.) Percy James Simpson, F.R.C.V.S.; Capt. (actg. Maj.) Sidney Joseph Williams.

THE MILITARY CROSS.

Capt. Chas. Holland; Capt. (temp. Maj.) W. Stephenson Lornie; Temp. Capt. (act. Maj.) R. Wallace Simpson.

For distinguished service in connection with Military Operations in Italy. (Dated 3rd June):—

THE MILITARY CROSS.

Temp. Capt. Robert Carr Allinson.

THE MERITORIOUS SERVICE MEDAL.

Pte. (actg. Sergt.) A. J. Wise, SE 7334 (London).

For distinguished service in connection with Military Operations in Salonika. (Dated 3rd June):—

TO BE BREVET LIEUT.-COLONEL.

Maj. P. J. Harris.

THE DISTINGUISHED SERVICE ORDER.

Capt. (actg. Maj.) John Rae, Spec. Res.

THE MILITARY CROSS.

Temp. Capt. Ernest James Burndred; Capt. John Arthur Fearnside.

Obituary.

PROFESSOR LIAUTARD.

ONE of the most persevering pioneers of Veterinary Science, whose name and work will be very much missed, has passed away at the ripe old age of 84. As with England, so with our other English-speaking ally, America, the foundation of veterinary colleges owes its inception to the persevering energy of a Frenchman, for Liautard has been to America what St. Bede was to Great Britain. A graduate of the famous Alfort School in 1856, Liautard crossed over to America and settled in New York, where he became Dean of the New York College of Veterinary Surgeons, studying human medicine at the same time at the University in that City, and graduating as a doctor in 1865.

It was largely owing to his efforts that the American Veterinary

Medical Association was started, as he was one of the original founders, and it is owing to this association that the veterinary profession in America holds the position it does to-day. Dr. Liautard was its first secretary and was unanimously elected President on numerous occasions. No man was more respected, and no opinions carried more weight, for it was always known and felt that whatever he brought forward had been always well thought out beforehand, and would be for the advancement of the profession. The "advancement of the profession" was the motto he always worked up to, and it was really astonishing to his British colleagues how his influence was felt in America during the later years of his life when he had returned to his beloved France to the retirement and rest he had so well earned. The loyalty of his American colleagues spoke volumes for his character and the high opinion in which he was held, and this was especially shown in the co-operation of the editorial staff of the *American Veterinary Review* (now known as the *Journal of the American Veterinary Medical Association*) with Liautard as Chief Editor, a position accorded to him for nearly fifty years. His old students speak of him as a wonderful teacher, one who could impress them in a way which they did not easily forget, and his enthusiasm was communicated to all with whom he came in contact. The text books emanating from his pen were always of a practical nature, all unnecessary padding being remarkable by its absence, whilst his knowledge of several languages enabled him to draw upon the work of scientists in France and Germany, and so be up-to-date. His foreign honours included the Chevalier du Merite Agricole of France and the Honorary Associateship of the Royal College of Veterinary Surgeons, and there is no doubt but that the title of the "Father of the Profession in America" was never more deserved by anyone. It was a title universally accorded to him by his American colleagues, and one of which he was very justly proud.

His memory will never die, and his example will ever be one to be followed and looked up to.

Note.

In our issue of November, 1917, there appeared an article by Captain E. A. Watson, C.A.V.C., entitled "Report on Ulcerative Cellulitis—Ulcerous Lymphangitis." With regard to the preparation of the vaccine used, it should have been stated that this was prepared according to the method of Truche—"Traitement bactériothérapie de la lymphangite ulcéreuse," by C. Truche.—Annales de L'Institut Pasteur t. xxxi. No. 5 May 1917."—By an unfortunate oversight and late arrival of the revision this was omitted.

Review.

VETERINARY *Post-Mortem* TECHNIQUE. By W. J. Crocker, B.S., V.M.D., Professor of Veterinary Pathology, School of Veterinary Medicine, University of Pennsylvania. Octavo, cloth XIV.+ 233 pp., 142 illustrations. J. B. Lippincott Co., Philadelphia and London.

THIS book fills a marked gap in English veterinary literature. We all value the services of the horse-slaughterer, and few of us feel quite competent to closely criticise his procedure at a *post-mortem*. The truth is that we depend on him almost as much as we do on the plumber, the mason, or the sweep. The reason is that quite a minority of us has ever been properly instructed or served our time at *post-mortem* work. Quite too little attention is given to the mechanics of dead body examinations in our College curriculum. This work will instruct us on how to proceed and it may be accepted as a good standard text book on the subject. The directions given as to opening a carcase, and the steps to be taken in a systematic examination of the internal organs, are clear and good. Many *post-mortem* instruments are enumerated and illustrated, and whilst the possession of all of them would not be a commercial asset to the general practitioner, yet one or two of them are of exceptional value, especially to the country veterinary surgeon.

There are eleven chapters in the volume, and the work on horses, cattle, sheep, swine, dogs, cats, mice, guinea-pigs, rabbits, fowls, and elephants is fully discussed and described. There is one valuable point in *post-mortem* decisions that we miss ; we refer to a consideration of the dimensions and weight of normal organs in dead animals. For comparative purposes and forensic cases this information is of vital importance. We hope the author will remedy the defect in a future edition. The binding, printing, paper, and get-up of the book are first-class.

G. M.

NOTICES.

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